Risk Factors Associated with HIV Infection among Male Prostitutes

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ABSTRACT

Objectives. This study documents the human immunodeficiency virus (HIV) and sexually transmitted disease seroprevalence rate for male prostitutes, identifies the risk factors for HIV, and provides baseline information for the development and implementation of appropriate prevention and intervention strategies.

Methods. Structured interviews were conducted with and blood samples were collected from 235 actively working male prostitutes in Atlanta, Georgia, from July 1988 through July 1991.

Results. The HIV seroprevalence was 29.4%; 25.1% of the sample had seromarker for syphilis and 58.3% for hepatitis B. Multivariate logistic regression analysis showed the following significant HIV risk factors: history of receptive anal sex with nonpaying partners, serologic history of hepatitis B or syphilis, and history of childhood physical abuse.

Conclusions. The reported seroprevalence rates among these male prostitutes indicate they are a high-risk group. The striking difference in HIV seroprevalence by sexual orientation may warrant special attention. Considering the public health consequences, there is a clear need for innovative HIV prevention and intervention among these men. (*Am J Public Health.* 1993;83:79–83)

Introduction

Extensive studies have documented the potential role of the female prostitute in the acquired immunodeficiency syndrome (AIDS) epidemic.[1–4] Although considerably less is known about male prostitution,[5–8] the emphasis on females has led researchers to neglect the possible importance of their male counterparts in transmitting human immunodeficiency virus (HIV) and other sexually transmitted diseases into heterosexual, homosexual, and bisexual populations. HIV studies of male prostitutes have been of limited scope,[8,9] have been conducted largely in institutional settings, or have involved self-report of HIV status.[7,10]

Male prostitutes engage in several identified high-risk behaviors for sexually transmitted disease and HIV. For example, they have multiple paying and nonpaying sex partners whom they have little opportunity to screen, they engage in sexual behaviors that place them at high risk for HIV,[7] they have high rates of sexually transmitted disease,[4,6,11] and they are often intravenous drug users.[10] They and their paying partners, who are almost invariably male, do not necessarily self-identify as bisexual or homosexual; a substantial number view themselves as heterosexual and report having female sex partners.[7]

The objectives of this study were to (1) determine the HIV seroprevalence rate for male prostitutes, (2) identify their risk factors for HIV infection, and (3) provide baseline information for the development and implementation of appropriate prevention and intervention strategies for these men.

Methods

Structured interviews and serum specimens were analyzed for 235 male street prostitutes who worked as prostitutes in Atlanta, Georgia, from July 1988 through July 1991. All study participants were 18 years of age or older, were observed soliciting customers in areas known for prostitution activities, and confirmed that they exchanged sex for money and/or illicit drugs within the past month. The refusal rate of 3% suggests little chance of selection bias; however, we cannot assume a random sample because it is impossible to enumerate all the male prostitutes in this largely hidden population.[12]

After informed consent was obtained and pretest counseling was provided, a blood sample was drawn and trained interviewers using a standardized instrument conducted private interviews in an area adjacent to the prostitutes' work setting. Respondents were reimbursed for their time. Study code numbers were used to ensure the respondents' anonymity. The serological results and posttest counseling were provided at the county health department's sexually transmitted disease clinic.

The respondents' drug use history was collected for the period 5 years prior to the interview; their history of needle sharing was assessed for the previous 10 years. Sexual behavior histories were also collected for the period 10 years prior to the date of the interview. The possible un-

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TABLE 1—Sample Characteristics of and HIV Prevalence among 235 Male Street Prostitutes

	No.	% HIV+ (n = 69)	Prevalence Ratio	P[a]
Age, y				
18–24	59	18.6	1.0	<.01[b]
25–34	146	30.1	1.6	
35+	30	46.7	2.5	
Education, y[c]				
<12	77	28.6	1.0	.540[b]
12	92	34.8	1.3	
>12	61	23.0	0.8	
Race				
White	117	24.8		.125
Black	118	33.9		
Sexual orientation				
Heterosexual	117	17.9		<.001
Bisexual	77	35.3		
Homosexual	41	43.9		
Knows person with AIDS				
Yes	116	37.1		<.05
No	119	21.8		
Years hustling				
0–4	59	13.6	1.0	<.001[b]
5–9	74	20.3	1.5	
10+	102	45.1	3.3	
Physically abused (prior to age 16)				
Yes	58	44.8		<.005
No	177	24.3		
Sexually abused[c] (prior to age 16)				
Yes	37	45.9		<.05
No	197	26.4		
Homeless				
Yes	67	40.3		<.05
No	168	25.0		
Syphilis				
Positive	59	55.9		<.001
Negative	176	20.5		
Hepatitis				
Positive	137	40.9		<.001
Negative	98	13.3		

Note. Seroprevalence percentages are based on the sample in that category, not on the entire sample.
[a]Except where noted, *P* value corresponds to χ^2 test for general association between characteristics and percentage who are HIV positive.
[b]χ^2 test for trend in percentage who are HIV positive across levels of characteristics (using midpoints of intervals).
[c]Total is less than 235 because of missing data.

reliability of retrospective data led us to emphasize behavior that had occurred in the year and month prior to the interview. Sexual partners included paying and nonpaying partners. Sexual orientation was measured in two ways. The first measure determined self-reported sexual identity by asking each respondent, "Aside from hustling (prostitution), are you gay (homosexual), straight (heterosexual), or bisexual?" If the response was "bisexual," the respondent was asked whether he preferred men or women as sexual partners. The second measure assessed actual sexual behavior and involved asking each respondent how many different male and female sex partners (paying and nonpaying) he had had during the past month. Because some of the men worked irregularly as prostitutes, if the respondent indicated that the amount of his sexual activity had been atypical during the previous month, his responses were based on his sexual activity in a "typical" month.

Serum was collected by venipuncture to determine HIV and sexually transmitted disease status. The specimens were sent for processing to the laboratories at the Centers for Disease Control, where they were then tested for HIV antibody by enzyme immunoassay with confirmation by Western blot assay. Serologic tests for hepatitis B surface antigen, core antibody, and surface antibody were done by solid phase radioimmunoassay. Tests for syphilis included the rapid plasma reagin, microhemagglutin-Treponema pallidum, and fluorescent treponemal-antibody absorption tests.

Statistical relationships between the categorical variables and HIV status were assessed using the χ^2 test or, when appropriate, Fisher's Exact Test. Prevalence ratios and *P* values were calculated for the ordinal level measures. Variables that were significantly associated with HIV infection were analyzed using logistic regression analysis to calculate odds ratios (ORs) and 95% confidence intervals (CIs).[13]

Results

Of the 235 respondents, 50.2% were Black and the remainder were White. Overall, the respondents had a median age of 25 years (range, 16 to 46), a median education of 12 years (range, 1 to 17), and a median working time as a prostitute (years hustling) of 6 years (range, 1 month to 18 years). Overall, 29.4% of the men had antibody to HIV (Blacks, 33.9%; Whites, 24.8%; $P = .125$), 58.3% had seromarker for hepatitis B (Blacks, 55.1%; Whites, 61.5%; $P = .310$), and 25.1% had seromarker for syphilis (Blacks, 38.1%; Whites 12.0%; $P < .001$).

The relationships of several sample characteristics to the presence of HIV antibody are shown in Table 1. Age and years hustling were both significantly related to HIV serostatus; men who were older than 35 years had a seroprevalence rate of 46.7%, compared with 30.1% for men aged 25 to 34 years and 18.6% for men under 25 ($P < .01$). Those men who had engaged in prostitution for more than 10 years had a seroprevalence rate of 45.1% compared with 20.3% for men who had worked as a prostitute for 5 to 9 years and 13.6% for those who worked less than 5 years ($P < .001$). Race was not significant.

Self-identified sexual orientation was related to HIV antibody status: 17.9% of heterosexuals were HIV antibody positive, compared with 35.3% of the bisexuals and 43.9% of the homosexuals ($P < .001$).[9] Knowing a person with AIDS[14] and having been physically and/or sexually abused prior to age 16 were also significantly re-

lated to one's HIV serostatus,[15,16] as were having seromarkers for syphilis ($P < .001$) or hepatitis B ($P < .001$).

We used respondents' sexual histories to examine the relationships between HIV serostatus and the prostitutes' sexual behavior during the previous month with both paying and nonpaying partners. The respondents reported a median of 20 paying partners (range, 6 to 160) and median of 2 nonpaying partners (range, 0 to 50) during the previous month. The number of both paying and nonpaying sexual partners was unrelated to HIV serostatus (Table 2),[17] as was the total number of paying and/or nonpaying sexual partners over the past year (data not shown). The type of sexual activity was significantly related to HIV antibody status. Almost 50% of the 39 respondents who engaged in receptive anal sex (with paying or nonpaying partners) during the previous month versus 25.5% of those who did not report this activity were HIV antibody positive ($P < .005$) (data not shown).

As shown in Table 2, the association between receptive anal sex and HIV was also statistically significant when analyzed separately for paying and nonpaying partners ($P < .005$ and $P < .001$). Having performed receptive oral sex (respondent fellating partner) in the past month with paying and/or nonpaying partners was also significantly associated with HIV seropositivity ($P < .05$).

Intravenous drug use was marginally associated with HIV serostatus (Table 2). Rates of any drug use reported for the previous month included intranasal cocaine (11.9%), crack cocaine (54.9%), cocaine injection (38.7%), heroin injection (12.8%), and nitrite poppers (34.0%). Having ever used crack, having ever used intravenous drugs, duration and frequency of crack use or use of injected drugs during the previous 5 years, and having ever borrowed or shared a needle for the purpose of injecting drugs were all unrelated to HIV status.

TABLE 2—HIV Status, Drug Use, and Sexual Behavior among 235 Male Street Prostitutes

	No.	% HIV+ (n = 69)	Prevalence Ratio	P[a]
Number of sexual partners (in the past month)				
Paying partners				
0–9	65	23.1	1.0	.122[b]
10–19	48	27.1	1.2	
20+	122	33.6	1.5	
Nonpaying partners				
0–1	90	26.7	1.0	.796[b]
2–4	67	34.3	1.3	
5+	78	28.2	1.1	
Receptive anal sex (in the past 10 years)				
Paying partners				
Yes	39	48.7		<.005
No	196	25.5		
Nonpaying partners				
Yes	32	59.4		<.001
No	203	24.6		
Receptive oral sex (in the past 10 years)				
Paying partners				
Yes	99	37.4		<.05
No	136	23.5		
Nonpaying partners				
Yes	127	35.4		<.05
No	108	22.2		
Fisting (in the past 10 years)				
Yes	46	26.1		.587
No	189	30.2		
Crack use (ever)				
Yes	129	30.2		.746
No	106	28.3		
Intravenous drug use (ever)				
Yes	120	35.0		.053
No	115	23.5		
Borrow others' needles[c] (in the past 10 years)				
Yes	65	38.5		.387
No	55	30.9		

Note. Seroprevalence percentages are based on the sample in that category, not on the entire sample.
[a]Except where noted, *P* value corresponds to χ^2 test for general association between characteristics and percentage who are HIV positive.
[b]χ^2 test for trend in percentage who are HIV positive across levels of characteristics (using midpoints of intervals).
[c]The characteristic of "borrowing others' needles" only refers to those people who are intravenous drug users.

Table 3 summarizes the univariate and multivariate logistic regression results for the variables included in the preceding bivariate analysis. Each of the univariate logistic regression results is based on one independent variable. HIV antibody–positive men were significantly more likely than HIV antibody–negative men to self-identify as homosexual, to have a history of syphilis and/or hepatitis B, and to engage in receptive anal sex with paying and/or nonpaying partners. Those who were older, self-identified bisexually, knew a person with AIDS, were homeless, had worked as a prostitute for 5 or more years, had been physically or sexually abused prior to age 16, had ever been intravenous drug users (marginally significant), or had engaged in receptive oral sex with paying and/or nonpaying partners were also statistically more likely to be seropositive than seronegative.

A multiple logistic regression procedure was used to evaluate all the variables that were significant in the univariate analysis. The following risk factors were significantly related to HIV seropositivity: having engaged in receptive anal intercourse with a nonpaying sexual partner in the past month (OR = 7.1; CI = 1.8, 28.1), and having a seromarker for hepatitis B (OR = 3.8; CI = 1.6, 9.0) or for syphilis (OR = 3.4; CI = 2.7, 7.4). Physical abuse was marginally significant because the lower limit of its confidence included 1.0.

HIV infection was not statistically associated with age or with identifying as a bisexual, knowing a person with AIDS, time spent working as a prostitute, having been sexually abused prior to age 16, being homeless, and engaging in receptive

TABLE 3—Logistic Regression Analysis of HIV Risk Factors and Markers for 235 Male Street Prostitutes

	Univariate Effect		Multivariate Effect	
	Odds Ratio	95% CI	Odds Ratio	95% CI
Age (5-y intervals)	1.5*	1.2, 2.1	1.1	0.7, 1.7
Sexual orientation				
Homosexual	3.6*	1.6, 7.8	1.4	0.4, 4.6
Bisexual	2.9*	1.5, 5.7	1.1	0.4, 2.6
Know person with AIDS	2.1*	1.2, 3.1	1.8	0.8, 4.0
Years hustling (5-y intervals)	2.5*	1.6, 3.7	1.7	0.9, 2.8
Physically abused (prior to age 16)	2.5*	1.4, 4.7	2.4*	0.9, 5.8
Sexually abused (prior to age 16)	2.4*	1.2, 4.8	0.8	0.3, 2.2
Homeless	2.0*	1.1, 3.7	1.9	0.9, 4.3
Syphilis seropositive	4.9*	3.4, 7.2	3.4*	2.7, 7.4
Hepatitis seropositive	4.5*	2.3, 8.8	3.8*	1.6, 9.0
Intravenous drug use (ever)	1.8	1.0, 3.1	0.7	0.3, 1.7
Receptive anal sex (in the past 10 y)				
Paying partners	2.8*	1.4, 5.6	0.8	0.2, 2.6
Nonpaying partners	4.5*	2.0, 9.8	7.1*	1.8, 28.1
Receptive oral sex (in the past 10 y)				
Paying partners	1.9*	1.1, 3.4	1.3	0.5, 3.2
Nonpaying partners	1.9*	1.1, 1.2	0.9	0.5, 2.1

Note. The reference category for "know person with AIDS," "physically abused," "sexually abused," "homeless," "intravenous drug use," "receptive anal sex," and "active oral sex" is "no." The reference category for "sexual orientation" is "heterosexual."
*Significant at .05 level.

oral sex or receptive anal sex with paying partners. More than 50% of the sample reported intravenous drug use, yet no measure of this variable significantly increased the risk for HIV infection.

Discussion

From a public health perspective, the reported HIV seroprevalence rate of 29.4% among the male prostitutes in this study is alarming. Male prostitutes engage in a unique combination of HIV risk behaviors that includes simultaneously engaging in high-risk sex, especially receptive anal intercourse; having multiple paying and nonpaying sexual partners (often males and females); and using drugs intravenously. According to the Centers for Disease Control, persons engaging in these behaviors account for most of the AIDS cases in the United States.[18] These reported findings are consistent with those of other studies among high-risk males.

Studies among homosexual males find that receptive anal intercourse is a more common mode of HIV transmission than intravenous drug use,[19] whereas among female prostitutes, intravenous drug use is the major risk factor.[1] This suggests that, among males who engage in both homosexual activity and intravenous drug use, HIV risks are mainly related to sexual behaviors. The absence of a relationship between HIV infection and intravenous drug use among this sample of male prostitutes does not imply, however, that injecting drugs is a safe practice for male prostitutes.

The findings support others indicating that, in terms of HIV risks, the number of a person's sexual partners is less relevant than is the type of sexual acts in which that person engages.[17] The strongest predictor of HIV serostatus in this study was receptive anal intercourse with nonpaying partners. Male as well as female prostitutes tend to be more at risk through sexual activities with their nonpaying partners than through activities with their paying partners. This is because they seldom, if ever, use a condom with their nonpaying partners[7] ($P < .01$), whereas they frequently, but inconsistently, use condoms with paying partners. Our findings suggest that the male prostitutes' sexual activity and not their intravenous drug use best explains their HIV rate.

The results of this study also confirm a strong relation between HIV infection and other sexually transmitted diseases.[4,19] Seromarkers for hepatitis B and syphilis were noted among 58.3% and 25.1% in this population, respectively, and these high rates of infection may indicate a significant transmission rate. The high rate of hepatitis B among these men may reflect the number of sex partners, the frequency of receptive anal sex, and high rates of intravenous drug use.[19] Syphilis-associated genital ulcers may explain the relationship between syphilis and HIV.[20]

The striking difference in HIV seroprevalence by sexual orientation warrants special attention. A person's sexual orientation determines, in part, the type of sexual acts that person is willing to engage in and the partners with whom that person has sex.[6,9] The HIV rates were significantly higher among the homosexually and bisexually oriented prostitutes, who were also more likely to engage in receptive anal intercourse than were their heterosexually oriented peers. While the data initially indicated a relationship between HIV infection and sexual orientation, these bivariate relationships were nonsignificant once a measure of receptive anal sex with either a paying or a nonpaying partner was evaluated simultaneously in the multivariate model. From then on, neither sexual orientation nor receptive anal sex with paying partners appeared to be significant. Receptive anal sex with nonpaying partners, however, emerged as a highly significant predictor. This finding may again be related to the higher rates of condom use with paying than with nonpaying partners. Childhood physical abuse was a marginally significant predictor of HIV serostatus and suggests the potential importance of childhood physical and sexual abuse in examining the etiology of HIV and other sexually transmitted diseases.

The reported seroprevalence rate among these male prostitutes indicates that they are a high-risk group. Through their sexual activities with multiple partners, they may spread HIV to their paying and nonpaying partners. Considering the public health consequences, there is a clear need for innovative HIV prevention and intervention among these men. Ironically, the heterosexually oriented men may not heed messages for homosexuals, and male prostitutes overall cannot be reached by efforts directed at female prostitutes. Further, many identify as male prostitutes and not as intravenous drug users; therefore, messages directed at intra-

venous drug users may also be missed. Intervention specifically targeted at male prostitutes is necessary to reduce the risk to them and their partners for HIV. □

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